Small Business Innovation Research/Small Business Tech Transfer

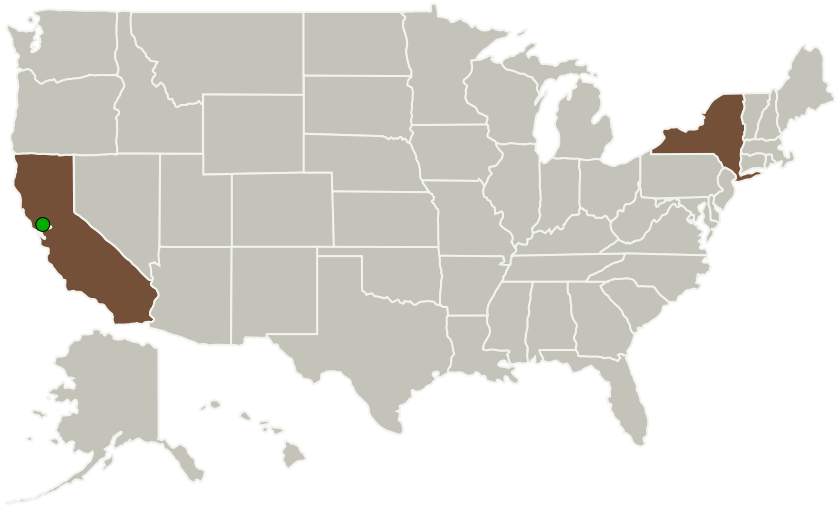
Recession-Tolerant Heat Flux Sensors for Thermal Protection Systems, Phase I

Completed Technology Project (2013 - 2013)

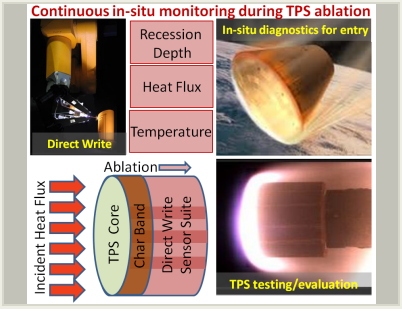
Project Introduction

The Phase I project will develop a suite of diagnostic sensors using Direct Write technology to measure temperature, surface recession depth, and heat flux of an ablative thermal protection system (TPS) in real time, which can be integrated to support TPS evaluation and in-situ diagnostics during planetary entry. Standalone heat flux sensors and those fabricated by direct deposition will be developed and demonstrated for integration within TPS materials for use in extreme re-entry conditions. The intent is to use the sensors for real time heat flux measurements to validate new materials and systems, as well as for flight structures where space and accessibility are limited. Methods for incorporating thermocouples, heat flux and recession sensors using Direct Write technology will be developed to provide accurate sensing capabilities. Notably, recession tolerant heat flux sensors will be designed and fabricated to demonstrate feasibility of this new heat flux sensor technology and subsequent instrumentation capability for TPS.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
MesoScribe Technologies, Inc.	Lead Organization	Industry	Setauket, New York
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



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Primary U.S. Work Locations	
California	New York

Project Transitions

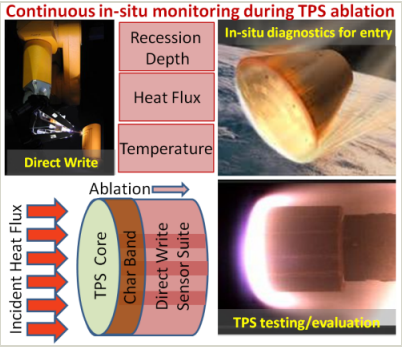
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140708)*

Images



Project Image
Recession-Tolerant Heat Flux Sensors for Thermal Protection Systems
(https://techport.nasa.gov/image/126649)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
MesoScribe Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

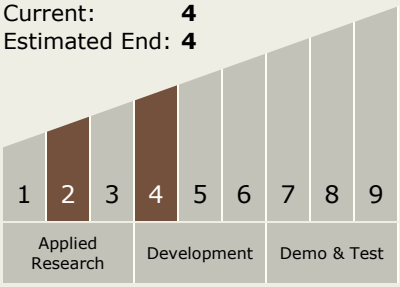
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Rob Greenlaw

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2013 - 2013)

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.6 Instrumentation and Health Monitoring for EDL

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System